

COMMITTEE ON GOVERNMENT REFORM

Subcommittee on Energy and Resources

DARRELL ISSA, CHAIRMAN



Oversight Hearing:

Conjunctive Water Management: A Solution to the West's Growing Water Demand?

April 5, 2006, 2:00pm
Rayburn House Office Building
Room 2154

BRIEFING MEMORANDUM

Summary

Booming population growth in Western States during recent decades has intensified the need for a more efficient water supply management system. Western States have long suffered from water supply challenges due to their arid climates. In response, several methods have been employed to maximize water supply, such as conservation programs and the building of new dams and desalination plants. Despite these methods, water supply and infrastructure, particularly in California, are vulnerable to an impending crisis. The California Department of Water and Resources (DWR) estimates that if the current trend of population growth continues, California will need an additional 1-2 million acre-feet of water per year by 2030 to meet demand. There is, however, a management system that may provide a solution to California's challenges as well as those of other Western States.

Experts propose that conjunctive water management is the leading and most effective method for resolving water supply challenges. Conjunctive water management is the method by which surface and ground water are stored in reservoirs and below-ground aquifers for distribution during dry months. Though this method would nearly double the amount of on-demand water supply, the implementation of conjunctive water management raises several areas of concern. The first concern is whether existing waterways can support a switch to conjunctive water management. As it stands, a move to conjunctive water management would require a tremendous amount of investment to retrofit existing infrastructure and storage facilities. The second concern is whether the states have the necessary resources to build and maintain a conjunctive water management program. A

comprehensive conjunctive water management system would require massive funding for maintenance and qualified personnel to manage and maintain the proper facilities.

Another important concern is the environmental impact of implementing a conjunctive water management system. For instance, an aquifer could be rendered useless if the surface water that was pumped into it was contaminated by foreign molecules such as salt. Since most water used for irrigation purposes is not filtered, contaminated water could be detrimental to agriculture. Moreover, as a practical matter, the construction of waterways and storage facilities will undoubtedly disturb wildlife habitats. As such, any construction must conform to state, local, and federal environmental laws. These concerns, taken together, raise the larger issue of whether, and to what extent, the federal government should be involved in the design, funding, or implementation of a conjunctive water management system.

Background

For more than a century, the federal government has been involved in constructing water supply projects through the Bureau of Reclamation (Bureau) of the Department of Interior. Traditionally, Bureau projects were focused on supplying water for agricultural irrigation and homesteading rather than municipal uses, which were primarily the responsibility of local authorities. However, in many Western States, agricultural water requirements are now increasingly in conflict with municipal and industrial needs due to booming population growth and the scarcity of water.

Consequently, the Bureau has increased its presence in delivery of water for municipal uses. The Bureau is now the largest wholesaler of water in the country, and it manages hundreds of storage reservoirs and diversion dams in 17 western states, providing water to approximately 9 million acres of farmland and 31 million people. Therefore, the Bureau has expanded its mission to become a contemporary water management agency that assists Western States, Native American Tribes, and other parties in balancing competing uses while meeting new water supply needs.

Conjunctive Water Management:

Conjunctive Water Management, also called Integrated Water Resources Management, consists of three primary components. The first is to recharge groundwater into an aquifer when surface water is available to increase groundwater storage. An aquifer consists of a mass of water flowing through the pores and cracks below the Earth's surface.

Groundwater recharge is the movement of surface water from the land surface, through the topsoil and subsurface, and into de-watered aquifer space. In some areas this is accomplished by reducing groundwater use and substituting it with surface water, allowing natural recharge to increase groundwater storage. The second component is to switch to groundwater use in dry years when surface water is scarce. The third component is to have an ongoing monitoring program to evaluate and allow water managers to respond to changes in groundwater, surface water, or environmental conditions. Conjunctive water management is most widely used in western states including Arizona, California,

Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming.

Potential Cost of Conjunctive Water Management:

Grant applications from the California Department of Water and Resources (DWR) Fiscal Year 2001-2002 Conjunctive Water Management Program show cost ranging from \$10 to \$600 per acre-foot of increase in average annual delivery. This wide range of costs is due to many factors including project complexity, regional differences in construction and land costs, availability and quality of recharge supply, availability of infrastructure to capture, convey, recharge and extract water, intended use of water, and treatment requirements. In general, urban uses can support higher project costs than agriculture uses. The average cost of all applications received by DWR is \$110 per acre-foot of increase in average annual delivery.

Primary Benefits of Conjunctive Water Management:

- **Improved Water Supply Reliability.** Conjunctive water management has the potential to increase average annual water supply throughout the State of California by 500,000 acre-feet with 9 million acre-feet of “new” groundwater storage.
- **Reduced Groundwater Overdraft and Land Subsidence.** Conjunctive water management in the Santa Clara Valley Water district has virtually stopped land subsidence caused by heavy groundwater use and has allowed groundwater to recover to a level last seen in the early 1900s.
- **Wildlife Habitat.** Conjunctive water management can provide environmental benefits when recharge basins are designed to be compatible with wildlife habitat, such as using natural floodplains and wetlands as recharge areas.

Primary Concerns Regarding Conjunctive Water Management:

- **Lack of Data.** There is rarely a complete regional network to monitor groundwater levels, water quality, land subsidence or the interaction of groundwater and the environment. Data is needed to evaluate conditions and trends laterally over an area, vertically at different depths, and over time. However, private property owners are often reluctant to provide information or allow access to collect additional information on groundwater. The result is that decisions are often made with only approximate knowledge of the water basin. This uncertainty can make any change in groundwater use controversial. Additional investment in a monitoring network and data collection can greatly reduce the uncertainty, but must be done in accordance with a groundwater management plan that is acceptable to all stakeholders in the basin.

- **Infrastructure and Operational Constraints.** Physical capacities of existing storage and conveyance facilities are often not large enough to capture surface water when it is available in wet years. Operational constraints may also limit the ability to use the full physical capacity of facilities.
- **Surface Water and Groundwater Management.** In California, water management practices and the water rights system treat surface water and groundwater as two unconnected resources. In reality, there is often a high degree of hydrologic connection between the two. Failure to understand the connection can lead to unintended environmental impacts.

Conjunctive Water Management in California: California Bay-Delta/CALFED

On October 25, 2004, the President signed into law P.L. 108-361 (H.R. 2828), which authorized implementation of the California Bay-Delta Program/CALFED. The initial authorization for CALFED funding (P.L. 104-208, Division E) was in response to a 1994 agreement among state and federal agencies, urban, agriculture, and environmental interests to protect the Bay-Delta while satisfying the primary needs of the various interests involved. A Record of Decision (RoD) for the current CALFED program was issued by a consortium of state and federal agencies in August 2000.

CALFED was created to address critical water quality, water supply and fish and wildlife issues in the 738,000 acre Bay-Delta estuary and has grown into a comprehensive effort to address long-term water supply/quality issues for most of California. The CALFED RoD anticipates that the program will increase groundwater storage by an additional 500,000 to 1,000,000 acre-feet. Consequently, efforts are underway across the State of California to design and develop conjunctive water management programs. P.L.108-361 also authorizes \$389 million for the federal share of the cost for activities authorized under the Act for FY 2005-FY 2010.

This hearing will address;

- What conjunctive water management projects are currently being implemented;
- The benefits and shortcomings of a conjunctive water management system;
- The extent to which the federal government should be – or in the very least is compelled to be – involved in the design, funding or implementation of a conjunctive water management system.

Witnesses:

- **Mr. Jason Peltier**, Deputy Assistant Secretary for Water and Science, Department of Interior
- **Mr. P. Joseph Grindstaff**, Director, California Bay-Delta Authority
- **Mr. Anthony J. Pack**, General Manager, Eastern Municipal Water District, Perris, CA

STAFF CONTACT

Larry Brady, Staff Director
Subcommittee on Energy and Resources
B-349C Rayburn House Office Building
202.225.6427 / 202.225.2392 fax